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nia through the roots was prevented, while the leaves were subjected to the influence of this substance in either a gaseous or dissolved condition. The upshot of his experiments was that a variety of plants subjected to these conditions all had the power of absorbing carbonate of ammonia by their aërial parts both in the gaseous and the dissolved condition and of employing it in the building up of their tissues. The plants did not appear however to thrive when the access of ammonia through the roots was entirely prevented. The experiments did not indicate that Leguminosæ have any special aptitude for absorbing ammonia through their aërial organs, nor for assimilating the combined nitrogen of the atmosphere.—A. W. B.

ZOOLOGY.

Pet Spiders.—Veritable pets they were, and why not? We hear of pet cats, pet monkeys, pet toads, and an English naturalist had his tame wasp; then why not pet spiders? But without considering why or why not I had them and enjoyed them for several months. The account which I now give of them is written from notes taken several years ago. I did not then nor do I now know the genus to which these spiders belonged, but think they may have been of the genus Lycosa. There were two taken at different times; the first I found under a stone, the second was brought to me pretty thoroughly benumbed with wet and cold, having been taken from a tub of water. I had already provided a domicile for my first capture in the shape of a large cigar box, covered with a pane of glass, and watched with some interest its reception of a new inmate, half expecting it would make an onslaught on the weaker one and kill it for its intrusion, but it manifested no interest whatever, until, enlivened by the warmth, the new comer began to move about, then it was evidently somewhat disturbed and kept to its own side of the box, and the stranger on coming to life enough to realize the presence of its fellow did likewise. Thus for a day or two they were exceedingly shy of each other, but in the course of a week their fear wore away and they were peaceable companions enough, but this amicable arrangement promised to end suddenly, as I thought, at one time, for while I was watching them they ran toward each other; as they met, rising on their hind legs, with the fore legs of each resting on the other's head and body, with jaws widely distended, they appeared as if about to engage in regular battle, but in a moment they dropped to their feet again and ran away from each other like two kittens at play; this I saw them do many times afterward, always ending in the same manner. I also often saw them chase each other around the box, first one and then the other being the pursuer. I thought then and still think they were at play, for never in any instance did they bite one another, nor manifest an appearance of wanting to do so. The only time I ever saw them exhibit ill temper was when I gave them water to drink, which I did once a day, pouring a small quantity upon the bottom of the box; the spiders always ran quickly to it, and oftentimes would stand with all their feet in the little puddle that I made for them, drinking long and steadily, and sometimes in their eagerness crowding each other; then one would seem to lose his temper and would drive the other away from the water. Another and very neat way I had of supplying them with water was with a piece of whalebone split fine at the end to form a sort of a brush; this would hold a drop or two. I held it near to one of the spiders, but high enough to oblige it to rise on its hind legs almost erect to reach it; this either would do as readily as a dog would have risen to my hand for a piece of meat; after the first two or three times that I supplied them in this way, sustaining themselves by resting the fore legs on the whalebone, sucking the brush dry before letting go of it. After a time I did not need to bring the whalebone near to them. I would merely show it inside the box and there was a run for it, the first one reaching it getting the first drink, the other awaiting its turn; it was a matter of surprise to me that they cared to drink so often and so much. I had supposed spiders were capable of sustaining long fasts, both in eating and drinking; in fact the experience of others teaches us that such is the case, but in this instance they were ready to drink at least once a day.

I supplied them well with flies for food and closely watched their method of taking them. The motion of a cat creeping upon a bird is as good an illustration as any of the method; the spider would creep to within the distance of an inch of the fly, stand perfectly still a moment and then throw the body forward as far as the length of the hind legs would admit, the hind feet not moving from the place on which they were fixed, preparatory to the spring. They did not often miss in the first effort, but, if they did, they made repeated attempts until the fly was captured, and after eating it they would set about cleaning themselves, a matter in which they were very precise, commencing with the legs first to clean the body, and afterwards the legs with the jaws and palpi; commencing with the first right leg, then washing the first left, next the second right and so on until all were clean, depositing the accumulated dirt in a minute heap in front of them, pushing it away with the fore legs when they were done. On one occasion I put a common house spider in the box with them, thinking that they would kill and eat it as they were much larger than the new spider, but instead of attacking it they seemed much alarmed and kept as far from it as possible. Thinking they would pluck up courage during the day I did not remove it; at night I found that the house spider had spun a web covering the most of the box, and my pets were stowed away in a corner completely cowed. I removed the house spider, tore out his web and they soon recovered their spirits and were as lively as ever.

I divided the box in which they were confined filling half to the top at one end with soft loam, thinking they would dig a hole in which to conceal themselves when so inclined, but they did not, though I saw evidence several times of their digging; in one instance the soil being excavated to some depth, but irregularly, having no appearance of the smooth round hole that we find in the fields dug by this or an allied species. I supplied a paper tube of suitable diameter and about three inches long, and this they both used, though rarely both at the same time; in only one or two instances did I find them both in it.—HENRY L. MOODY.

REPRODUCTION OF A FISH'S TAIL.—In Lyell's "Principles of Geology,"* occurs the following sentence: "The pectoral and tail fins of many fresh water fish, having been cut off, have been perfectly restored in about six weeks' time." As this statement embodies a fact with which many naturalists seem to be unacquainted, I am glad to be able to give it a new confirmation.

In the rooms of the Boston Young Men's Christian Union there is a fine aquarium, well stocked with gold and other fish. Early in the spring of 1873, the well known fish fungus (*Achlya prolifera?*) made its appearance in the tank, and several fine fishes died. Among the specimens attacked by the fungus was a young goldfish, which by some unknown means had lost its tail fin. The fungus came out all over the stump of the tail, the fish became sick, and was apparently dying. At the time I knew nothing of the nature of the destructive fungus, but having my attention called to the case, I at once concluded that I had to deal with some parasite, and resolved to try to exterminate it. The only caustic available happened to be strong nitric acid, a few drops of which I applied to the affected tail stump, allowing it to remain a moment or two, after which I rinsed it off in clean water, and restored the fish to the tank. Of course the parasite was killed; the patches of fungus sloughed off, and the sick fish soon became well and healthy. A few days later I thought I saw more of the fungus appearing upon the previously affected part; but, upon looking more closely, found that the appearance was really due to the growth of new rays. In the course of a month a new tail fin, perhaps a fourth of an inch long, had appeared, which continued to grow rapidly, so that in three months from the time of my experiment the fish could not be distinguished from others in the aquarium. The lost tail was reproduced with absolute perfection, the reproduction taking place not only under my own eyes, but also under the observation of several competent witnesses.

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*Tenth London Edition, vol. ii, p. 478.

This case seems to me interesting as a confirmation of what was already known, and also as showing that the reproduction of the lost part was not prevented even by the application of one of the most powerful and destructive of all caustics.—F. W. Clark.

The Kinglets in New Jersey.—We are somewhat surprised to find it stated in the latest work on North American ornithology* that the two kinglets (*Regulus satrapa* and *R. calendula*) are not *known* to breed in the United States, but that a few are *believed* to remain throughout the summer in Maine, "and probably breed in the dense *Thuja* swamps." Both of these kinglets are quite abundant in New Jersey from early autumn until late in spring, as is well known; and we have twice stated (Geology of New Jersey, 1868, p. 769, and volume iv of this Journal), that a few individuals remain, during the breeding season, among the mountains of Sussex county of this state. Both there and in the adjacent territory of Monroe and Pike counties, separated from Sussex county by the Delaware River, here a narrow stream, the kinglets, in scanty numbers, unquestionably do remain throughout the summer months. As I knew of their presence in June, July and August, I presumed they bred there, very naturally (*both* the presumption and the breeding). In the summer of 1871, I had an opportunity of examining a number of warbler and other small bird skins, and among them were two unmistakable skins of *Regulus calendula*. These skins were marked "Laurel (*Rhododendron*) swamps, Monroe county, Penn., July 11, 1871."

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*A History of North American Birds by Messrs. Baird, Brewer and Ridgway. Land Birds. Vol. i, p. 73-76, Boston, 1874.

What indeed is more likely than that these birds, which are so abundant during autumn, winter and early spring, should occasionally remain as far south as New Jersey, especially when we consider that the northern portion of the state, and the adjacent counties of Pennsylvania, are all so admirably adapted to their wants and likings? Especially is this true of Monroe and Pike counties in Pennsylvania, where there are almost impenetrable rhododendron jungles and hemlock swamps. Throughout summer, these wild by-ways are always cool and damp, just as a locality some miles to the south, which has already been described in the NATURALIST (vol. ii, p. 39) by T. C. Porter, who says of it, here "the ice accumulates in immense masses during the winter and lies undisturbed until late in the spring." It was here that Prof. Porter sought northern plants and was rewarded "by the discovery of *Sedum Rhodiola* DC.—an inhabitant of high latitudes in Europe and America." Have we not here a precisely similar instance in botany, to that, in ornithology, of the presence of our two kinglets, during the summer months? With our migratory birds the geography alone does not decide all their movements—the geology too has its influence; and this is notably the case with reference to the movements of the countless thousands of warblers that follow the valley of the Delaware on their northward migration in spring; and also with those semi-arctic species that, visiting us in winter, are checked on their return sojourn, as summer approaches, by the dense, damp forests of the Delaware valley, where winter long seems to linger in the air, just as in April, in the hollows of the woods, the unsunned snow is still lingering when the fields and open glades are bright with violets, Epigæa and the columbine. —CHARLES C. ABBOTT, M.D., *Trenton*, *New Jersey*, *Feb.* 18, 1874.

THE HONEY-ANTS.—It is but a few years since this animal was described by Westmael, under the name of *Myrmecocystus Mexi-*

canus. What is known of it is still imperfect, and a prolonged study would elucidate many interesting facts.

I first saw this animal last summer in Santa Fé, but it was not till late in the fall that I had occasion to examine its habitation.

A structure like a crater about one inch in diameter indicates where they live underground; they make no hills like other ants. A narrow canal of the diameter of a quill leads several feet deep, it is variously contorted and sometimes widened out to a chamber; in such chambers or cavities are seen stored up five, six and more honey-ants serving as a larder for the others that are not honey producing, the latter performing the other household duties; they are very small and of a yellow color.

The opinion that the honey is discharged into receptacles is entirely erroneous; the only receptacle is their own abdomen swollen up to the size of a pea, clear, transparent; the intestines even being recognized as a narrow canal winding through the rounded and puffed-up abdomen. The strain on the membrane is such as almost to cause it to burst. Many do burst, for on digging up the habitation very carefully, one can often notice specks of the soil entirely saturated with liquid honey, and near by the collapsed ant. In many cases the rupture produces death, and the non-producing ants are seen around such places enjoying the sweet liquor.

The honey has an agreeable taste, slightly acid in summer from a trace of formic acid, but perfectly neutral in autumn and winter; it contains a little more water than the honey of bees, and has therefore somewhat greater limpidity. The Mexicans press the animals, and use the gathered honey at their meals; others prepare by fermentation an alcoholic liquor from it.

It would be worth while for beekeepers to try to introduce them into some kind of bee-hive fitted with a suitable dry soil and the proper food at hand for them.

The average weight of a non-producing ant is two milligrammes, that of a full honey-ant two hundred and forty milligrammes, a contrast simply immense.—Dr. OSCAR LOEW, *Chemist and Mineralogist to Lt. Wheeler's Exploring Expedition.*

SPIZELLA BREWERI (?) IN MASSACHUSETTS.—M. W. Stone brought me a ♂ sparrow shot December 15, 1873, in Watertown, Mass. It was in company with *S. monticola*. I could not identify it with the aid of any of the books I had at hand, and so sent it to H. W. Henshaw, who kindly compared it with the series of *S. Breweri* he took in Arizona, now in the Smithsonian. He replies in substance as follows:— "Though hardly typical *Breweri* it is strikingly that species—at any rate can be identified with no other. The peculiarities may result from a modification by climatic influences, or may be merely individual abnormality. The whole upper parts, but particularly the crown, are almost exactly as in *Breweri* proper (no trace of chestnut on crown); the same is the case regarding relative lengths of wing and tail, the latter being longer than the former in *Breweri* (wing 2·40, tail 2·60 in *Breweri*) wing 2·52, tail 2·63 in this specimen. In *S. socialis* these proportions are reversed. The bill is strikingly diminutive, smaller than in any *Spizella* I ever saw. The bill and feet are darker than in *Breweri*, while a strong ashy suffusion of the under parts, which also to less degree tinges the whole plumage, are points of dissimilarity from the characteristic flaxen or gray-colored shades of *Breweri*, and an approach to *socialis*."—WILLIAM BREWSTER, *Cambridge, Mass.*

[NOTE.—Dr. Coues, on reading the above, says that he carefully examined the specimen while it was in Mr. Henshaw's hands, and agrees that it cannot be distinguished specifically from *Breweri*, though it has some points about it indicating *socialis*, suggesting a possible hybrid of the two.—EDS.]

THE CHIMNEY SWIFT; CHANGE IN PLACE OF NESTING.—I see by the NATURALIST of December, 1873, that Mr. J. H. Sears, of Beverly, Mass., has noticed *Chætura pelasgia* to forsake the old chimney and build its nest in a barn in company with the barn swallows (*Hirundo horreorum*). A similar instance came under my observation a few years ago. A pair of chimney swifts selected the *end* of a barn *inside*, and there, about three feet below the vertex of the roof, built and reared their young for several years. This was in Lewis Co., N. Y. As this country became settled, these birds deserted the hollow trees of the forest and took up their abode in our chimneys. But here they find, after sad years of experience, that during every heavy rain (unless the mouth of the chimney is very small) numbers of their nests are washed away. And now we see that some of them, at least, have come to the wise conclusion that they are "never too old to learn" and have acted accordingly. Is not this a good example of the influence of civilization and domestication upon the habits of birds, and can it all be attributed to *instinct?*—C. HART MERRIAM.

THE MYRIOPOD CERMATIA POISONOUS.—Day before yesterday, a lady in this house stepped on a *Cermatia forceps* when she was barefoot. It was evening and dark. She thought at first that she had trodden on a carpet tack, but it seemed quite different soon, more like the effects of a coal of fire.

She lighted the gas, and saw the large Cermatia which bit her. It was wounded by her tread and had its revenge. It bit just between the toes and her foot swelled a good deal, and pained her so much that she consulted me. But it yielded to an application of ammonia and camphor.

The swelling and pain continued about thirty-six hours, keeping her awake most of one night.—JOSIAH CURTIS, M. D., *Washington, D. C.*

BLIND CRUSTACEA.—A new and interesting genus of Decapod Crustacea has been described by Mr. Wood-Mason (in the Proceedings of the Asiatic Society of Bengal, August, 1872) which was dredged in deep water off the eastern coast of the Andaman Islands, and which is closely allied to the northern European *Nephrops Norvegicus*, but, like *Calocaris MacAndreæ* of Bell, is destitute of the organs of vision.—Prof. WESTWOOD'S *Address before the Entomological Society of London.*

BIRDS AND CATERPILLARS.—In the very timely article from Dr. Packard in the May NATURALIST, Mr. C. J. Maynard is reported as stating, that no bird but the Baltimore oriole will feed on the tent caterpillar. Last season I noticed that the black-billed cuckoo fairly exterminated this pest in an orchard near the college, though the tents existed in great numbers. Both the robin and blue-jay will eat the larvæ of the *Dryocampa senataria*, and in eating them have done great service to our state.—A. J. COOK, *Agricultural College, Lansing, Mich.*

A SINISTRAL HELIX ALBOLABRIS.—While collecting land shells with Mr. Anson Allen of Orono, Maine, we found a sinistral shell of the *Helix albolabris* with the animal still alive in it, but as the lip had not been turned, Mr. Allen took it home and kept it till the lip was fully turned.—C. H. FERNALD.

Note on Preserving Insects in Collections.—I have devised a method for preserving insects without the trouble of camphor. No Psocus, nor *Cheyletus eruditus*, nor other pest dares enter a box after I have treated it. Having a clean-papered box I wash it with common carbolic acid (disinfecting solution) with two-thirds water. It dries without any stain, and I find, after many months' trial, a perfect result. Sheets of card thus medicated give me all the small, soft Hemiptera, etc., with antennæ, etc., not eaten by Psocus, as was formerly the case.—T. A. Marshall, *in Entomologist's Monthly Magazine.*

GEOLOGY.

Deep Sea Explorations (Report Brit. Assoc. in Athenæum for Sept. 27).—The largest audience of the week was gathered together on Tuesday morning (the final sitting), to hear Commander J. E. Davis discourse "On the recent Achievements of the Challenger Deep-sea Expedition." Capt. Davis confined himself to the proceedings of the Challenger Expedition north of the equator, which formed a natural section of the voyage. The operations with which he chiefly dealt were the deep-sea soundings viewed in their relations to physical geography rather than to zoology, which, as is well known, occupies a large portion of the attention of the scientific staff of the Expedition. He described and exhibited to the meeting the various mechanical contrivances adopted to sound the greatest depths with accuracy, ascertain the temperatures, and bring up mineral and zoological specimens from the bottom. In the course of the voyage outward from the Thames to Gibraltar, and thence to Madeira and the Canaries, the first interesting set of soundings were taken off the entrance to the Straits of Gibraltar. The soundings over a large area in this section are as follows: just beyond the meridian of Cape St. Vincent, due west of the straits, 2,500, 2,125, and 2,250 fathoms; and, again, between Madeira and the Canaries 2,350, 2,400, 2,200, and 1,975 fathoms; but westward and northward, outside this area, the depths diminish to 1,525, 1,400, 1,550, and 1,650 fathoms. These results seem to indicate the existence of another deep basin outside the Mediterranean, circumscribed by a ridge similar to the two deep basins within that sea. Great depths were found close up to the islands of the Madeira and Canaries group, but a much